The Office of the Second Line of Defense

Configuration Management Guidelines

March 2006

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1.   Introduction

Configuration Management is the process by which the integrity of the design, construction/installation, testing, commissioning, and sustainability decisions of a project are documented, reviewed, and controlled.

1.1   Purpose

The development of these Second Line of Defense (SLD) Configuration Management Guidelines (CMG) will formalize the use of standard configuration management practices and procedures across all SLD program elements. A coherent, robust, and flexible configuration management programmatic approach is needed in order to properly ensure all deployed radiation detection systems perform as intended and the physical/functional configuration of systems are adequately identified, documented, and controlled. The benefits of a strong configuration management (CM) program are many and include some of the following:

- Identifies and helps maintain integrity of program and project-level configuration items (CIs)

- Promotes the consistent use of baseline program-level CIs, such as standard designs, firmware, and software versions

- Proactively manages proposed changes to CIs without causing costly project delays

- Prevents unauthorized scope creep or system changes that will undermine SLD risk reduction goals

- Allows the Department of Energy (DOE) to provide a complete and accurate set of documentation to recipient countries after system commissioning

- Provides traceable documentation for all proposed and approved changes

- Serves as a useful tool to help maintain integrated project schedules.

The SLD CMG establish the process by which CIs are identified, changed, controlled, accounted for, and audited. The intent of this document is to create reasonable CMG that are simple, not overly bureaucratic, time consuming, or costly. In developing the CMG, the following basic principles were established to help guide the effort:

- Ensure processes and procedures accommodate change, not hinder it

- Ensure all proposed changes to CIs are properly vetted, approved at the appropriate level, and involve the right project stakeholders

- Preserve flexibility so the majority of decisions can be fast-tracked to support aggressive project schedules

- Optimize current CM practices that are being used by DOE national laboratories and direct federal contractors (e.g., change control logs)

- Keep the document at the program-level – the guidelines are not meant to dictate internal CM processes for all DOE national laboratories or direct federal contractors

- Keep it simple – do not develop an elaborate or overly sophisticated process that will require a significant program investment.

This CMG document is broken down into three main sections and includes several appendices that provide templates for proposing changes to SLD CIs. Section 1 includes this introduction and common CM definitions and acronyms. Section 2 covers the basic organizational framework and the administrative roles and responsibilities of the various change control boards and CM support personnel that have been established to manage the overall process. Section 3 provides a detailed process and CM requirements discussion on the four essential and interdependent components of the CMG, which include configuration identification, configuration control, configuration status accounting, and configuration audits.

1.2 Scope

The scope of this document includes the establishment of configuration management guidelines for the DOE's Office of the Second Line of Defense, which includes the Megaports Initiative and the SLD Core programs.

The SLD CMG apply to:

- all SLD program-level decisions regarding and/or relating to the CIs controlled under the SLD Program

- all phases of an SLD project lifecycle including engineering and design, construction and installation, operational testing and evaluation, and sustainability.

1.3 Definitions and Acronyms

1.3.1 Definitions

Configuration control – Activities consisting of the control of changes to a configuration item after formal establishment of its configuration documents. Change control involves the systematic proposal, justification, evaluation, coordination, and disposition of approved baselines and changes, and the implementation of approved baseline documentation and configuration items.

Configuration – Interrelated functional and physical characteristics of a hardware and/or software product as defined in technical documents and achieved in the product/system.

Configuration baseline – Configuration of a hardware and/or software product that establishes the approved characteristics at a given point in time that serves as a reference for activities throughout the project lifecycle.

Configuration item – Aggregation of hardware, software, technical documentation, or any of the discrete portions that are designated for configuration management and treated as a single entity in the configuration management system; an item within a *configuration* that satisfies an end-use function.

Configuration item information – Requirements for product design, realization, verification, operation, and support.

Configuration management – Coordinated activities to direct and control configuration consisting of configuration identification, configuration control, configuration status accounting, and configuration auditing.

Configuration status accounting – Is the activity that records and reports CI descriptions and all changes to CI. It includes the formalized recording and reporting of *configuration item information*, the status of proposed changes, and the status of the implementation of approved changes.

Class I change – A change from an approved baseline that requires approval by a Change Control Board prior to implementation.

Class II change – A change from an approved baseline that does not require approval by a Change Control Board prior to implementation.

Design change documentation – Formal documentation that provides traceability of a change to a *baselined configuration item* (examples are Field Change Notices, approved Field Change Requests, and design requirements change logs).

Dispositioning Authority – Person or group of persons assigned responsibility and authority to make decisions on the configuration.

Field Change Request Form – Formal documentation used to request review and approval of a Class I change

Field Change Notice Form – Formal documentation used to record the implementation of a Class II change.

Master Equipment List – The central program repository for all project-level configuration item information.

1.3.2   Acronyms

CCB	Change Control Board
CI	Configuration Item
CM	Configuration Management

CMG	Configuration Management Guidelines
COR	Contracting Office Representative
COTR	Contracting Officer Technical Representative
CSDRD	Communications System Descriptive Requirements Document
DCD	Design Change Documentation
DRD	Design Requirements Document
FCN	Field Change Notice
FCR	Field Change Request
GA	General Arrangements (as in GA Drawings)
GFE	Government Furnished Equipment
HQCM	DOE-HQ Country Manager
HQOD	DOE-HQ Office Director
HQODD	DOE-HQ Office Deputy Director
HQPM	DOE-HQ Program Manager
MEL	Master Equipment List
OT&E	Operational Testing and Evaluation
RPM	Radiation Portal Monitor
SRS	Software Requirements Specification
SDD	Software System Design Documentation
SLD	Office of Second Line of Defense
WBS	Work Breakdown Structure

2. Configuration Management

This section provides the organizational framework by which the SLD program will operate with respect to configuration management. It identifies and describes the roles, responsibilities, and scopes of authority related to the design, implementation, and verification of the SLD configuration management process.

2.1 Organization

While there are many important configuration management activities performed by the various stakeholders within the organization, the primary organizational roles identified within this strategy consist of the

- SLD Program-Level Change Control Board (CCB)
- Project-Level CCBs
- SLD Program CM administrator
- Project CM designee
- Master Equipment List (MEL) administrator

2.2 Roles and Responsibilities

2.2.1 The SLD Program CCB

2.2.1.1 Roles

The primary authority for SLD program management resides with the DOE-HQ Office Director (HQOD). The SLD Program CCB establishes and oversees the policy and processes for the CMG.

The primary dispositioning authority for the SLD CMG resides with the SLD Program CCB, whose members include:

- HQOD and/or the DOE-HQ Office Deputy Director (HQODD)
- Megaports DOE-HQ Program Manager (HQPM)
- Core HQPM
- SLD Contracting Officer Technical Representative(s) (COTR)

In addition to the expertise of the primary members listed above, the SLD Program-Level CCB may request technical expertise from a number of additional stakeholders to assist with technical discussions and decisions. Rather than having a broad range of technical subject matter experts that permanently reside on the Program-Level CCB, the intent is to have the appropriate personnel participate based on the technical issue being evaluated. In effect, CCB membership will vary and be largely dependent on the technical nature of the change request. It is expected that representatives from the DOE national

laboratories, direct federal contractors and as needed, other subject matter experts will be called upon to participate on the Program-Level CCB.

The primary function of the SLD Program-Level CCB is to review proposed changes to established program baselines; determine if configuration changes are necessary through evaluation of the benefits, costs, and other factors of approving a change; ensure all approved changes are properly documented and categorized; and to review/update the CMG as necessary. The Program-Level CCB also documents denials of proposed changes and the reasons for such denials.

2.2.1.2   Responsibilities

The specific responsibilities of the SLD Program-Level CCB include the following:

- Review and approval of the SLD CMG document

- Review and approval of all changes and revisions to the CMG

- Review and approval of all program-level standard designs, interface documents, drawings, and equipment specifications

- Review and authorization to use a commercially available software package for the SLD program MEL (as defined in Section 3.3, *Configuration Status Accounting*)

- Review and implementation of a data storage strategy for the SLD Program

- Review and approval of all proposed changes to program-level, baselined CIs

- Review and disposition of proposed changes at the project level that will likely have program-wide implications

- Meet on a periodic basis to discuss proposed changes to program-level baselines, the status of approved changes, and any other CM issues

- Handle other items related to CM as necessary and appropriate.

2.2.2   SLD Project-Level CCBs

2.2.2.1   Roles

The primary dispositioning authority for SLD projects resides with the site-specific project CCB, whose members may include:

- HQPM – The respective program HQPM (Megaports or Core/Maintenance)

- DOE-HQ Country Manager (HQCM) – The respective program HQCM (Megaports or Core/Maintenance)

- Designated COTR

- Project leads (either DOE national laboratory and/or direct federal contractor leads)

In addition to the expertise of the primary members listed above, any of the SLD Project-Level CCBs may request technical expertise from a number of additional stakeholders to assist with technical

discussions and the decision-making process. Rather than having a broad range of technical subject matter experts that permanently reside on the Project-Level CCB, the intent is to have the appropriate personnel participate based on the technical issue being evaluated. In effect, CCB membership will vary and be largely dependent on the technical nature of the change request.

2.2.2.2   Responsibilities

The responsibilities of any SLD Project-Level CCB include the following:

- Identification of a Project CM designee to be the point of contact for all project-level CM issues

- Review and approval of all CM issues at the project level

- Review and approval of all site-specific general arrangement designs, specifications, and communications system design

- Review and approval of all Class I changes as defined in Section 3.2, *Configuration Control,* during the Construction and Installation, Operational Testing & Evaluation (OT&E), and Sustainability phases

- Elevation of all program-level CM issues to the SLD Program CCB.

2.2.3   SLD Program CM Administrator

2.2.3.1   Role

The role of the SLD Program CM administrator is to oversee the implementation of the SLD CM Program and its adherence to the CMG. The SLD DOE-HQ Office Deputy Director (HQODD) serves in this capacity and will identify one or more additional staff members within SLD to assist with the day-to-day administrative responsibilities specified below.

2.2.3.2   Responsibilities

The specific responsibilities of the SLD CM Administrator include the following:

- Collect and process all program-level Configuration Item Change Request forms

- Organize and attend the periodic meetings held by the SLD Program CCB

- Provide configuration status accounting on program-level issues as defined in Section 3.3, *Configuration Status Accounting*

- Disseminate program-level baseline change information to all affected organizations and program stakeholders

- Administer/maintain the DOE-HQ SLD share drive (for share drive requirements, see Section 3.3, *Configuration Status Accounting*)

- As bulk equipment is purchased for the program that has not yet been allocated to a specific project, provide the MEL administrator with the required configuration information to allow for configuration accounting.

2.2.4 Project CM Designee

2.2.4.1 Role

The Project CM designee is identified by the HQCM as the point of contact for all CM issues for that project. The Project CM designee is the interface to the SLD Program CM administrator as program-level changes are made that affect the project.

The Project CM designee is the interface to the MEL administrator with regard to all inventory baseline data and the updating of that baseline data throughout the project lifecycle.

2.2.4.2 Responsibilities

The specific responsibilities of the Project CM designee include the following:

- As bulk equipment previously purchased is allocated to the specific Project, collect the model and serial numbers for the portal monitors being deployed and provide to the MEL administrator

- At the completion of the Construction and Installation Phase, retain copies of all final design documents and as-built drawings

- At the completion of the OT&E Phase, provide the MEL administrator with the site-specific baseline threshold and other portal monitor setting information from the OT&E Report

- As field changes are approved and implemented during the Sustainability Phase, provide the MEL administrator with the updated configuration information

- Assign Field Change Notice (FCN) and Field Change Request (FCR) document numbers using the numbering convention defined in Section 3.1, *Configuration Identification*

- Provide the SLD Program CM Administrator with scanned copies of FCNs and approved FCRs for official storage in the country-specific folder on the DOE-HQ SLD share drive

- Review monthly reports provided by the in-country maintenance contractor to determine if the portal monitor settings or system configuration have been modified. If so, provide this information to the SLD MEL administrator to ensure the most current portal monitor information is recorded in the MEL.

2.2.5 Master Equipment List Administrator

2.2.5.1 Roles

The MEL administrator resides at Los Alamos National Laboratory and will receive baseline configuration item information from the SLD Program CM administrator and the project CM designees to incorporate into a consolidated database as defined in Section 3.3, *Configuration Status Accounting*.

2.2.5.2 Responsibilities

The specific responsibilities of the MEL administrator include the following:

- Administer and maintain the SLD MEL

- At the completion of the Construction and Installation Phase, upload into the MEL site-specific equipment inventory data received from the Project CM designee

- At the completion of the OT&E Phase, upload into the MEL site-specific baseline threshold and other portal monitor setting data from the OT&E Report

- Update the MEL as field changes are approved and implemented during the Sustainability Phase

- Interface with DOE-HQ stakeholders as specific project baseline data are needed

- As field changes are made during the Sustainability Phase, provide the SLD Program CM administrator electronic updates of the MEL for storage in the country-specific folder on the DOE-HQ SLD share drive.

3.   Configuration Management Activities

The CM strategy consists of four essential and interdependent activities that include the following:

- Configuration Identification

- Configuration Control

- Configuration Status Accounting

- Configuration Audits

3.1   Configuration Identification

Configuration identification is the process by which CIs and its interrelated physical and functional characteristics are identified and documented.

3.1.1   CI Selection

The selection of program- and project-level CIs is based on those physical and functional characteristics that can be managed separately to achieve the overall end-use performance of the CI.

All program-level design parameter documents, interface documents, standard design documents, and process guidance documents are placed under configuration management as a Program CI. Selected program-level CIs will remain under configuration management until such time as identified by the HQOD.

All project-level design requirement documents, site-specific designs, and equipment and software specifications are placed under configuration management as a project CI. Selected project-level CIs will remain under configuration management throughout the project lifecycle. Table 3.1 lists the identified program- and corresponding project-level CIs.

Table 3.1. SLD Program- and Project-Level CIs

Program-Level CI	Project-Level CI
Standard/Reference Designs (communications and civil)	Design Requirements Document (DRD)
SLD CMG	Communications System Design Requirements Document (CSDRD)
SLD Implementation Process & Guidelines Document	Concept of Operations (CONOPS)
Hardware Specifications (portal monitors)	General Arrangements (GA) Drawings
Program-Level Configuration Item Change Request	System Requirements Specification (SRS)
TSA Firmware Version	Final Designs (software system design document and civil engineering designs)
Standard Software Versions	Design Change Documentation
SLD Sustainability Guidelines	Hardware/Software Specifications
Government Furnished Equipment (GFE) Interface Document	OT&E Plan
SLD OT&E Guidelines Document	OT&E Report
Generic CSDRD	Operations & Maintenance Manual (site-specific)
Generic CONOPS	Acceptance Test Plan
SLD Strategic Plan	Final Installation Reports
Megaports Program Plan	Training Management Plan
Standard Acceptance Test Guidelines	FCR
Maritime and Land Prioritization Models	FCN

3.1.2   Numbering Convention

Configuration items that fall under the numbering convention outlined in this strategy include FCRs and FCNs. Other documents, such as design parameter documents authored by DOE national laboratories and deliverables authored by contractors, fall under their respective internal organizational numbering conventions.

The numbering convention used by the Project CM designee when assigning FCR and FCN numbers will utilize the same characters found in the existing SLD program Work Breakdown Structure (WBS). The number assigned will typically contain a total of nine characters. The first character is *7* to designate the Office of the Second Line of Defense. The second character identifies the SLD program with a 1, indicating a Core/Maintenance project, and a 2, indicating a Megaports project. The third character

identifies the country code; the fourth, the Project code; the fifth, the type of document with an *N* representing an FCN and an *R* representing an FCR. The sixth character indicates the number of documents of that type that have been generated for the specific project. Characters 6 through 8 are port-specific, the format and content of which is at the discretion of the Project CCB. An example of its application may be the use of generic terminal or gate identifiers to help manage the submittal and status of the various FCR and FCNs prepared for the project.

As an example, an FCN generated for the Megaports Port of Algeciras in Spain would have the following number:

> *7.2.7.1.N4.C1*

where   7 = SLD
        2 = Megaports project
        7 = country code for Spain
        1 = Port/site code for the Port of Algeciras
       N = Notice
       4 = 4th FCN generated at the port/site
     C1 = identifier specific to port

For each project, a template will be generated for the FCN and FCR numbering sequence. The first four characters will be pre-coded into the template (i.e., 7.2.7.1), requiring the in-field originator to fill in only the remaining characters (i.e., N4.C1).

3.2   Configuration Change Control

After the initial release of CI information, all changes are controlled. Configuration change control is the exercising of established procedures to classify, evaluate, approve, implement, and verify changes to the CI information. CI information consists of all conceptual design parameter documentation, final designs, and as-built documentation.

A goal for the SLD program is to keep the number of configuration changes to a minimum, thus all proposed substantive changes will be carefully examined to ensure there is sufficient rationale for change authorization. Proposed changes not required to meet SLD program requirements will be approved only if they can be justified on a cost/benefit basis.

In order to avoid implementation delays, the SLD program must strive to initiate, review, and approve/disapprove configuration change requests, both at the program- and project-level CCBs, as expeditiously as possible. Although there may be some exceptions depending on the level of complexity involved, all program-level CM decisions will be dispositioned no later than 30 days after the issue has been communicated to the SLD Program-Level CCB. Likewise, all project-level CM decisions will be dispositioned no later than 15 days after the issue has been communicated to the Project-Level CCB.

It is recognized that each contractor has its own internal change control program in place and the intent of this document is not to require modifications to established contractor CM processes or procedures. The SLD CMG is designed to minimize duplication of effort while still meeting program- and project-level change control requirements that support sound program/project management practices.

3.2.1 Project-Level Configuration Change Control

The change control process is presented as it pertains to each of the four major SLD project lifecycle phases, namely:

- Engineering and Design Phase
- Construction and Installation Phase
- OT&E Phase
- Sustainability Phase

3.2.1.1 Engineering and Design Phase

During the Engineering and Design Phase (see Figure 3.1 for Megaports and Figure 3.2 for SLD Core), configuration information (e.g., CSDRD, DRD) produced by federal country managers, DOE laboratories and/or direct federal contractors will be placed under configuration management as a configuration item upon the initial release of the information. Initial release of the information is defined as the release from an organization after it has been reviewed and approved by all project stakeholders including the host government.

After the engineering and communications survey is conducted, the GA drawings and software system requirements and/or software design document are produced and the technical scope of the project is refined, with respect to the design requirements and critical interface points, at a scoping meeting. Changes from the design requirements that are agreed upon and approved by the project team in the scoping meeting are documented with DCD. DCD provides baseline traceability (see Appendix A). While it is a contractual requirement that DOE contractors provide a design requirements compliance matrix to DOE-HQ, the CI providing traceability is the design change log authored by the project team and approved by the HQCM.

CI information (e.g., GA drawings, software system requirements specifications) produced by DOE direct federal contractors will be placed under configuration management upon formal acceptance by DOE-HQ and the host government.

In instances where electronic platforms are generally common (e.g., SRS developed with Microsoft® Word®), the HQCM and/or DOE Lab Project Manager can retrieve the information from the contractors' websites. To facilitate this process, access to the direct federal contractors' websites will be granted to all project team members. In instances where the electronic platforms are not generally common (e.g., GAs developed with AutoCAD), the HQCM and DOE Lab Project Manager will receive a hard copy from the contractors.
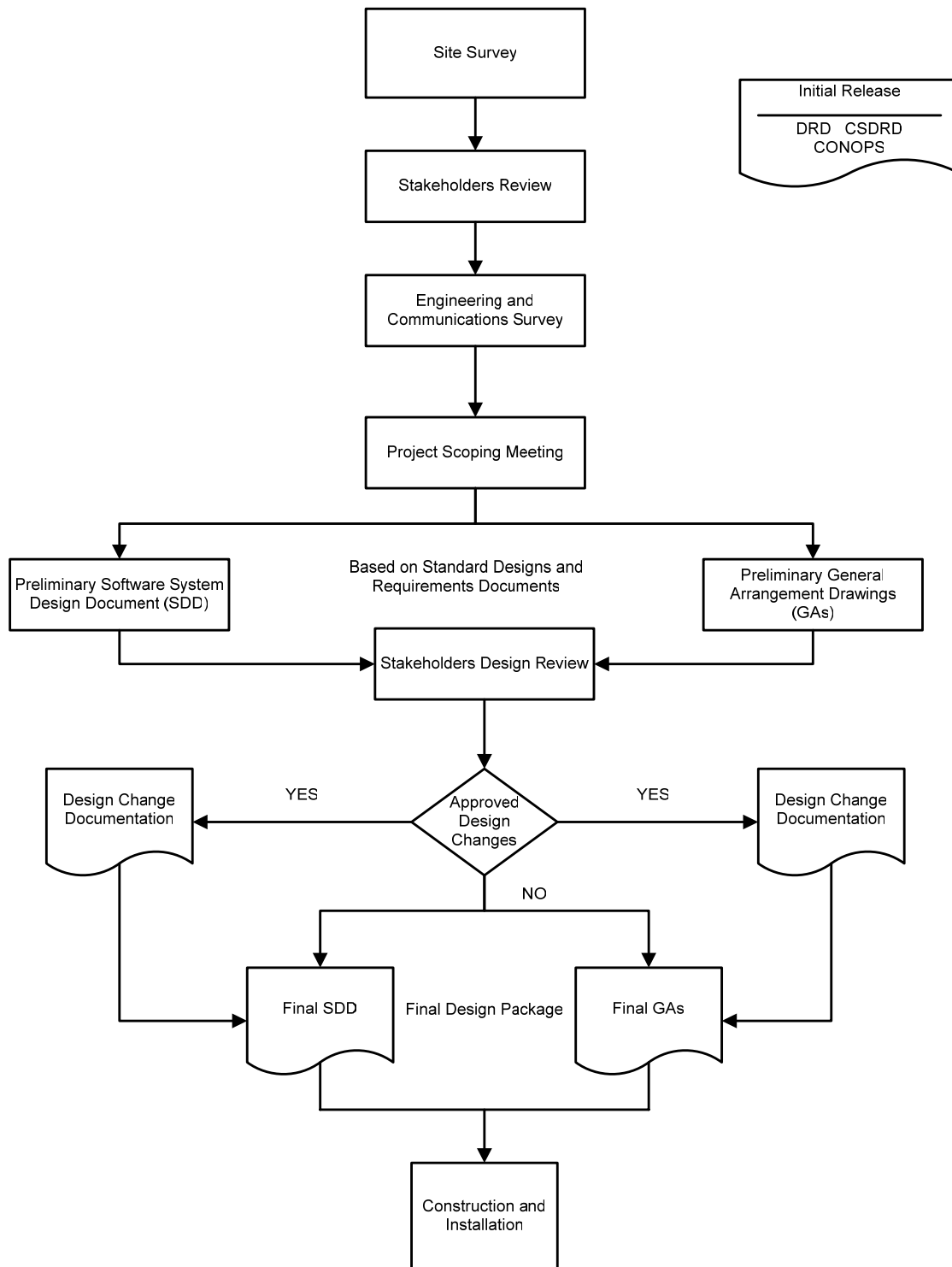
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         │                                       │    DRD   CSDRD      │
         ▼                                       │       CONOPS        │
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│   Stakeholders  │
│      Review     │
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│  Engineering and│
│ Communications  │
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│ Project Scoping │
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┌──────────────────────┐  Based on Standard Designs and  ┌──────────────────────┐
│ Preliminary Software │    Requirements Documents       │ Preliminary General  │
│ System Design        │                                 │ Arrangement Drawings │
│ Document (SDD)       │                                 │       (GAs)          │
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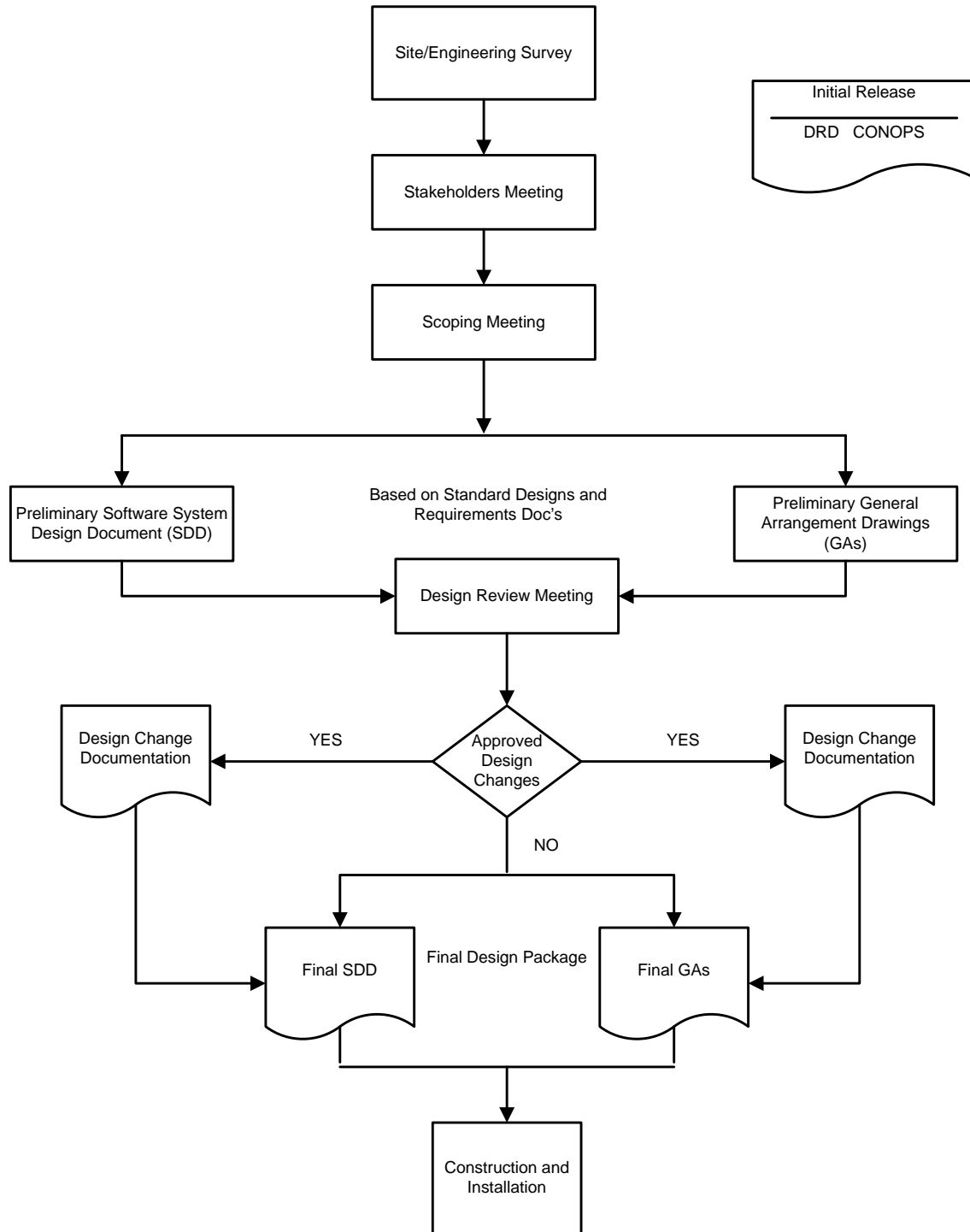**Figure 3.1**.   Engineering and Design Phase (Megaports)

Figure 3.2. Engineering and Design Phase (SLD Core)

In the event that a need for a change arises after the final designs are approved, but before the start of construction (i.e., during the final design review meeting), an informal evaluation and disposition process will be used by the project team. If the change is approved, it will be formally documented via a DCD.

Once the final design package is completed and approved by the HQCM, it will be provided to the appropriate DOE contracting officer and will serve as the basis for the design/build and communications contractors to develop their formal technical and cost proposals.

3.2.1.2   Construction and Installation Phase

During the Construction and Installation Phase (see Figure 3.3), changes to the approved CI information (i.e., final design) are inevitable. When a change is identified in the field, proper categorization of the change must be made. The onsite construction manager has the primary responsibility for determining whether field construction changes should be classified as Class I or Class II. The project communications lead has the same responsibility for field changes associated with software development and software installation activities. These decisions will be closely coordinated with the appropriate HQCM and project manager.

A Class I change is material to the extent that it must be brought before the dispositioning authority (i.e., Project-Level CCB) for evaluation and approval before the change can be implemented in the field. If the Project-Level CCB approves the change request, the appropriate DOE contracting officer will be immediately notified so the contractual authorization process can be initiated with the contractor(s). No work shall begin on the CCB-approved changes until formal authorization is provided by the DOE contracting official.

A Class II change is immaterial to the extent that the designated in-field authority (construction manager/communications lead) has full authority to proceed with implementation of the change without formal evaluation and approval from the Project-Level CCB.

The criteria by which all changes are classified during the Construction and Installation, OT&E, and Sustainability phases of the project are as follows:

- Physical or Functional Integrity – If the physical or functional integrity of the configuration item, as outlined in the configuration information, must be changed, the change is categorized as Class I; otherwise, it is categorized as Class II.

- Cost – If the implementation of the change will result in an increase in cost, then the change is categorized as Class I; otherwise, it is Class II.

- Schedule – If the implementation of the change will likely result in a slippage of the project schedule, then the change is categorized as Class I; otherwise, it is Class II.

- Scope – If the implementation of the change requires new work outside the scope of the approved final designs, then the change is categorized as Class I; otherwise, it is Class II.

- Contract – If the implementation of the change requires, in any way, an amendment to the task order between the contractor and the DOE, then the change is categorized as Class I; otherwise, it is Class II.

In an effort to minimize the effects of field changes on project schedules, the evaluation of a Class I change by the Project-Level CCB will be as expedient as possible. In most cases, communications will be informal via telephone and email to facilitate process efficiency.

Documentation of changes during the Construction and Installation Phase will be dependent on the type of change involved. To submit a Class I change to the Project-Level CCB, an FCR (see Appendix B) will be generated. An FCR documents the proposed change, the consequences of the change, suggested and details of other configuration items, and information that may be affected by the change. If the proposed change will have schedule impacts, the contractor will include a draft updated schedule along with the FCR documentation in order for the CCB to fully understand the situation and render an informed decision.

The Construction and Installation Phase will typically last several months. In an effort to disseminate timely status information to the Project-Level CCB, the in-field contractors will include in their monthly summary reports all Class II changes implemented in the field.

Final documentation of all Class II changes will also be captured at the completion of the Construction and Installation Phase. These changes will be documented in the final as-built documentation delivered to the DOE.

3.2.2   OT&E Phase

All changes proposed during the OT&E Phase (see Figure 3.4) will be handled using the same general change classification, review, approval and documentation process established for earlier project phases with a few minor exceptions.   One important difference is that the DOE National Laboratory Project Lead, Direct Federal Contractor Lead, and/or the HQCM are responsible for determining the change categorization (Class I versus Class II). At the completion of the OT&E Phase, the overall system configuration will be baselined for the installed radiation detection system. This information will be documented in the final OT&E report and will include the software/firmware versions installed, portal monitor spacing, threshold settings, and other key configuration item information. This configuration information is captured in the OT&E report and transmitted to the MEL administrator by the Project CM designee at the conclusion of the OT&E Phase.
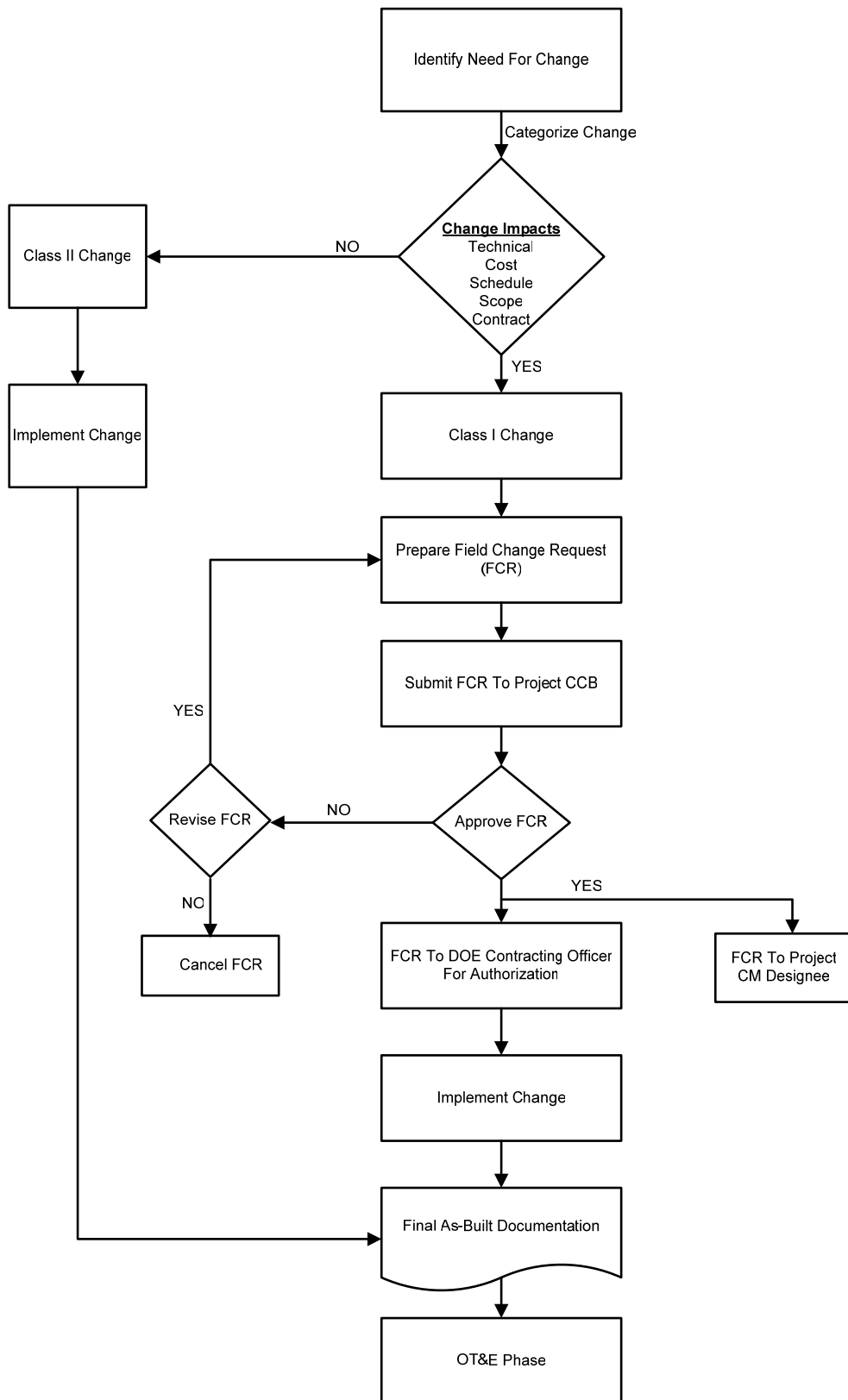
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                    │ Change              │
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                              │ Categorize Change
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┌──────────────┐   NO      ◇  Technical    ◇
│ Class II     │ ◄──────── ◇  Cost         ◇
│ Change       │           ◇  Schedule     ◇
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       │           │       ┌─────────────────────┐
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       │           │       │ Project CCB         │
       │           │       └─────────────────────┘
       │           │              │
       │       ◇ Revise ◇   NO  ◇ Approve ◇
       │       ◇ FCR    ◇ ◄──── ◇ FCR     ◇
       │           │              │  YES
       │         NO               │
       │           ▼              ▼              ▼
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       │    │ Cancel    │  │ FCR To DOE   │  │ FCR To       │
       │    │ FCR       │  │ Contracting  │  │ Project      │
       │    └───────────┘  │ Officer For  │  │ CM Designee  │
       │                   │ Authorization│  └──────────────┘
       │                   └──────────────┘
       │                          │
       │                          ▼
       │                   ┌──────────────┐
       │                   │ Implement    │
       │                   │ Change       │
       │                   └──────────────┘
       │                          │
       │                          ▼
       │                   ┌──────────────────────┐
       └──────────────────►│ Final As-Built       │
                           │ Documentation        │
                           └──────────────────────┘
                                  │
                                  ▼
                           ┌──────────────┐
                           │ OT&E Phase   │
                           └──────────────┘
```

Figure 3.3.   Construction and Installation Phase (includes acceptance testing)
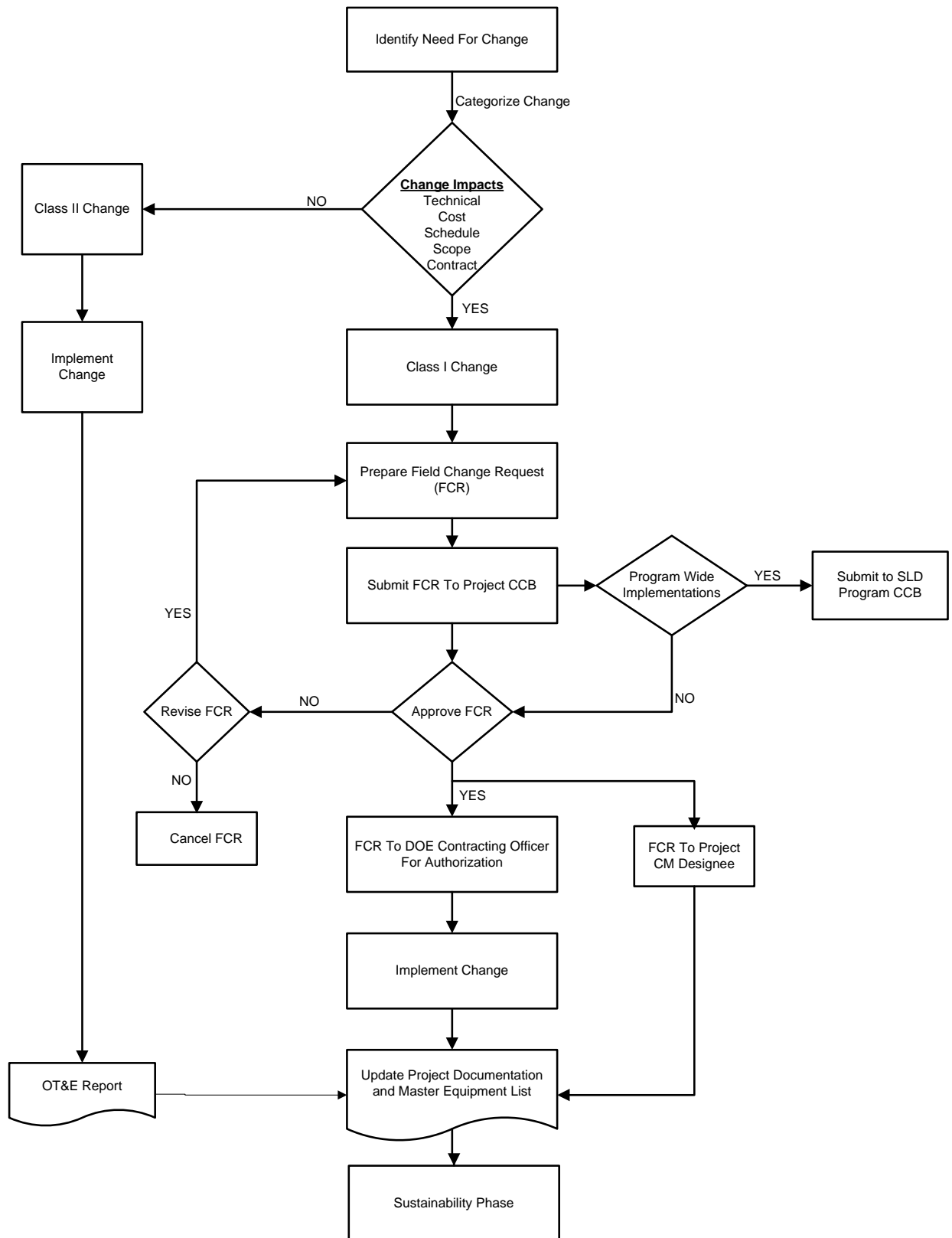
Figure 3.4.   Operational Testing and Evaluation (OT&E) Phase

3.2.3 Sustainability Phase

All field changes proposed during the Sustainability Phase will be handled using the same general change classification, review, approval and documentation process established for earlier project phases but with a few minor exceptions (see Figure 3.5). Similar to the OT&E Phase, the DOE National Laboratory Project Lead, Direct Federal Contractor Lead, and/or the HQCM are responsible for determining the change classification (Class I versus Class II). During the Sustainability Phase an FCN (see Appendix A) will be generated in order to document and track all Class II changes. The FCN documents the change that was made, the reason the change was made, and the impacts of the change. An FCN will need to be generated for changes to the system or product that were made by the host country and/or the maintenance contractor. The completed FCN provides current status to the SLD Program.

Once the radiation detection system has been formally accepted, commissioned and transferred to the host country for operation, it is acknowledged that it may be difficult to maintain a real time status of system configuration information during the Sustainability Phase of the project.   Furthermore, it is not the intent of this document to require the recipient country personnel to submit field change requests to the project-level CCB for approval or to complete field change notices. During the Sustainability Phase, system configuration information will be exchanged via country specific data sharing agreements and will focus on maintaining a dialogue about the performance of the SLD installed equipment. As part of these interactions, the project team will monitor the system configuration information and notify the MEL Administrator if changes have been unilaterally made by the recipient country personnel.

3.2.4 Program-Level Change Control

As outlined in Section 2.1, *Roles and Responsibilities*, any proposed change that is initiated at a project level that will likely impact other SLD program projects MUST be elevated from that Project-Level CCB to the SLD Program-Level CCB. The process by which these program-level configuration management issues will be raised is depicted in Figure 3.6. In brief, requested changes to program-level CIs will be submitted to the SLD CM administrator via a Program-Level Configuration Item Change Request form (see Appendix C). Each SLD program manager retains the primary responsibility to identify all project-level CM issues that may have cross-cutting programmatic implications. Proposed changes to program-level CIs that do not originate with any specific project, but that would affect multiple SLD program projects, may also be submitted to the SLD CM administrator using the Program-Level Configuration Item Change Request form. The Program-Level CCB will hold meetings on an as-needed basis to review all CI change requests.
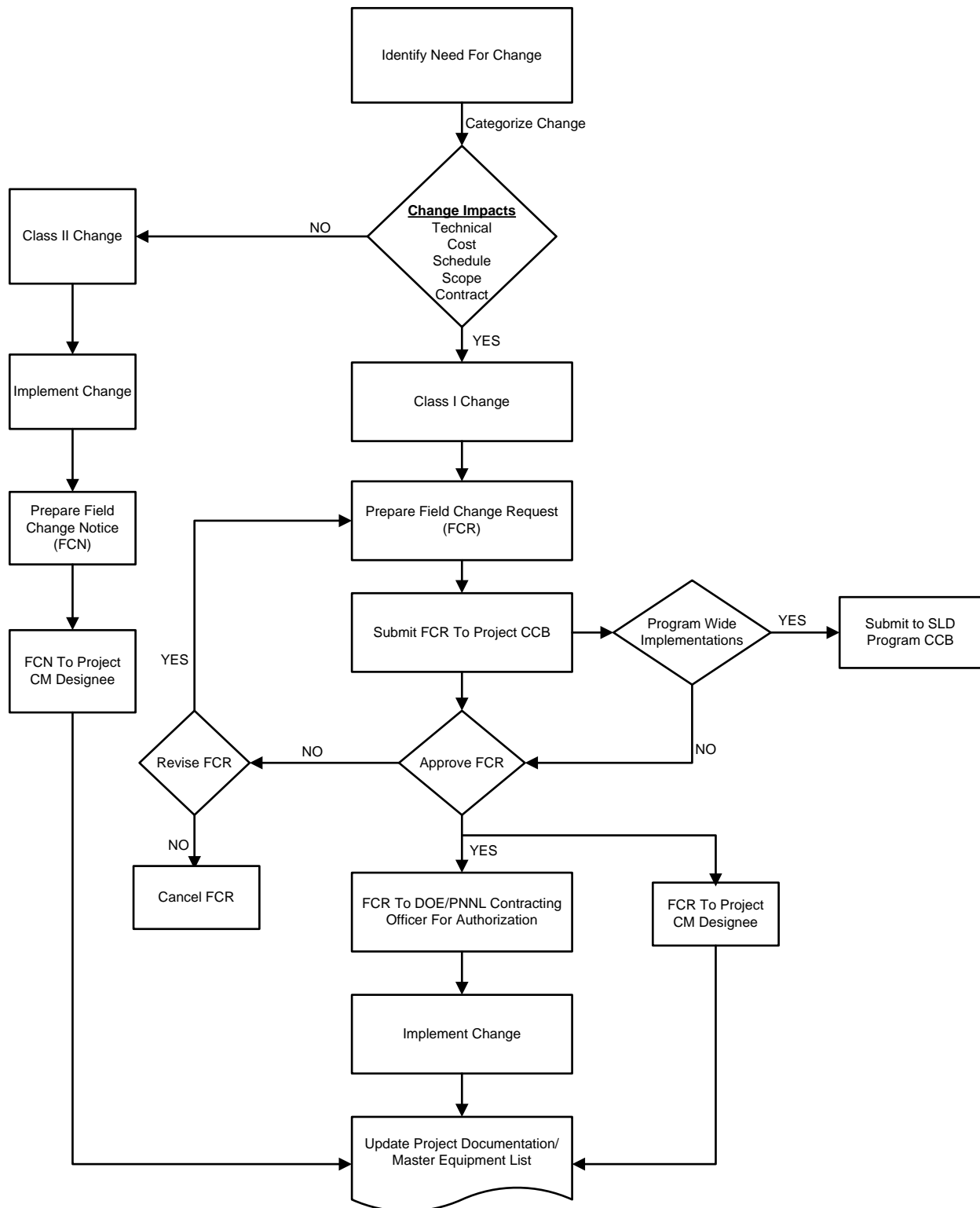
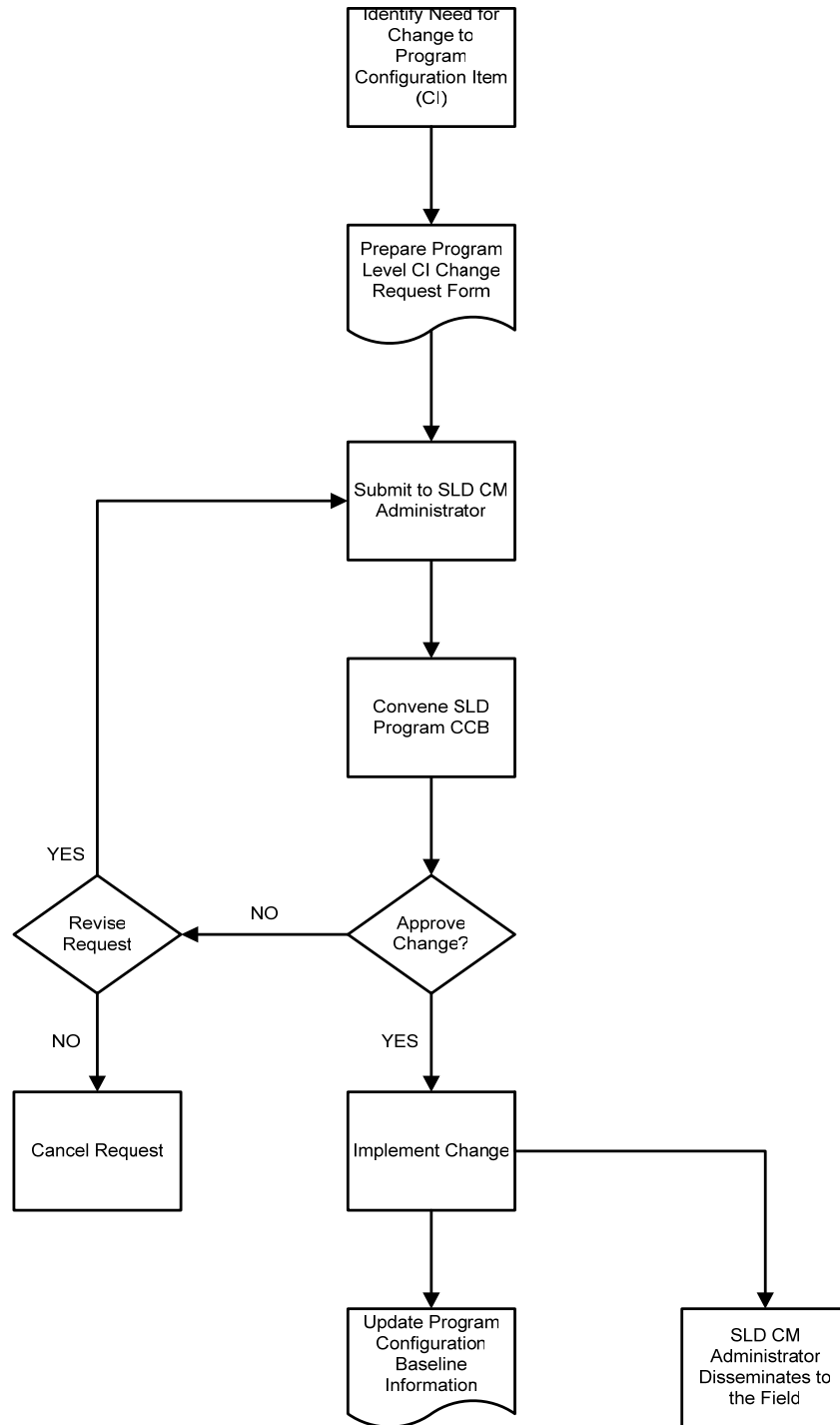**Figure 3.5**.   Sustainability Phase

3.12

Figure 3.6.   Program-Level Change Control Process

3.3 Configuration Status Accounting

Configuration status accounting is the recording of CI information upon identification, approval status of proposed changes, and implementation status of approved changes during all phases of the project lifecycle.

As identified CIs are placed under configuration management, their status is recorded. Configuration status information that is produced by DOE laboratories or direct federal contractors is internally recorded, stored, and updated as changes are approved. Configuration status information that is produced by direct federal contractors and is a DOE deliverable is stored by the SLD Program CM administrator in an electronic form (whenever possible) in the country-specific folder on the DOE-HQ SLD share drive.

To enable the central storage of SLD program equipment and software data for each project, a MEL will be populated and maintained at Los Alamos National Laboratory. The MEL will store the following data:

- equipment manufacturer model and/or serial numbers

- equipment locations

- installation dates

- software version

- firmware version

- hardware versions

- threshold settings

- background radiation setting.

As changes to CIs are approved and implemented, the MEL will be updated to reflect a current representation of the CI. Historical data on CIs will be archived for traceability. As the master equipment list is updated, the MEL administrator will send country specific updates to the HQCM for storage on the DOE-HQ SLD share drive.

To protect the integrity of the configuration information stored by the various stakeholders, it is recommended that the information be stored in an environment that provides protection from unauthorized change, provides means for data backup and recovery, and that permits responsive retrieval.

The status of proposed changes at the program level will be monitored by the SLD Program CM administrator. The status of proposed changes at the project level will be monitored by the designated Project CM designee for that port/site.

3.4 Configuration Audits

Configuration audits are performed by project team members in accordance with documented procedures to determine whether a CI conforms to its requirements and the approved baseline configuration information.

Configuration audits will verify the physical and functional characteristics of installed CIs (e.g., hardware, software). An example of such an audit is during acceptance testing of a project.

During the Sustainability Phase, assurance visits to ports/sites will serve as configuration audits and will be conducted by project team members to verify compliance with the approved physical and functional requirements of the CI. Another source of audit information may be provided by monthly reports generated by in-country preventative maintenance contractors, U.S. Embassy staff, or representatives of the host government. The goal is to maintain up-to-date configuration information about the radiation detection systems deployed by the SLD program worldwide. Current system configuration information is critical to maintain, as it provides DOE the added assurance that systems are effective in detecting target quantities of special nuclear and other radiological materials of proliferation concern.

Appendix A:

Example of Design Change Documentation (DRD Change Log)

Example of Design Change Documentation (DRD Change Log)

Site Name	Original Scope of Work	Observations/Changes taken from Site Survey
Terminal A Main Gate	Install 7 dual-pillar vehicle monitors Install 14 video cameras Install 1 local alarm station Install 6 remote alarm panels Install 3 drop bars	**Monitors** 1. Relocate the oversize lane dual-pillar vehicle monitor from the terminal side to the midpoint of the lane **Imaging** 2. Install 1 additional video camera to capture bi-directional flow in lane 4 3. Install 1 additional video camera to capture bi-directional flow in the oversize lane **Speed Bumps** 4. Add 1 speed bump in lanes 1−3, just before entering the monitor in the export direction 5. Add 2 speed bumps in the oversize lane on either side of the monitors **Drop Bars** 6. Add 1 drop bar at the second booth in lane 4 to be used in the export direction, controls should be located in the adjacent lane 4 booth nearest to the terminal 7. Remove terminal side drop bars from lanes 5−6 8. All 9 drop bars will be installed by the Megaports Program; Maersk will not install any drop bars **Traffic Lights** 9. Add 3 traffic lights on the terminal side of the portal monitors in lanes 4−6 10. Install controls for the traffic light in booths 4−6 **Signage** 11. Paint a "stop" line in lanes 4−6 on the terminal side of the traffic lights **LAS** 12. Install 1 additional LAS at the CFS warehouse **SWS** 13. Install 1 SWS

Appendix B:

Field Change Request

Field Change Request

Field Change Request Form		
Second Line of Defense		
1. Site:		**2. Date:**
3. Title:		**4. FCR #:**
5. Originator:		
6. Current Configuration (describe issue or basis for change):		
7. Proposed Configuration (describe proposed change):		

8. Change Impacts (mark all that apply):

☐ Physical Integrity of Configuration Item   ☐ Cost
☐ Functional Integrity of Configuration Item   ☐ Work Scope
☐ Contract   ☐ Schedule (See attached)
☐ Other_____

9. Implementation/Non-implementation Impacts (pros/cons):

10. Configuration Items Impacted

☐ DRD   ☐ Site CSDRD   ☐ GA Drawings   ☐ Final Design
☐ OT&E Plan   ☐ OT&E Report   ☐ HW Specifications   ☐ SW SRS
☐ TSA Firmware   ☐ TMP   ☐ CONOPS   ☐ Sustainability Plan
☐ Others _____

11. Organizations Impacted / Involved in Review

☐ AGSC/TtEC   ☐ LANL   ☐ SNL   ☐ TVI
☐ PNNL   ☐ SI International   ☐ TSA   ☐ ORNL
☐ Other _____

12. CCB Authorized Signature:

_____Date:_____/_____/_____

13. SLD CM Administrator:	14. Date Master Equipment List Updated (if applicable):

Appendix C:

Field Change Notice

Field Change Notice

Field Change Notice

Second Line of Defense

1. Site:	2. Date:
3. Title:	4. FCN #:

5. Originator:

6. Previous Configuration (describe problem or basis for change):

7. Changed Configuration (describe solution or implemented change):

8. Originator Signature:

_____Date:_____/_____/_____

9. SLD CM Administrator:	10. Date Master Equipment List Updated:

Appendix D:

Program-Level Configuration Item Change Request

Program-Level Configuration Item Change Request Form

Second Line of Defense

1. Configuration Item Description:	2. Date of Submittal:
3. Originator:	4. CR #:

5. Current Configuration (describe problem or basis for change):

6. Proposed Configuration (describe proposed change):

7. Implementation/Non-implementation Impacts:

8. Configuration Item Impacted

☐ Standard Designs   ☐ CSDRD   ☐ HW Specifications
☐ CM Strategy   ☐ GFE Interface Doc.   ☐ SW Specifications
☐ SLD Implementation Guidelines   ☐ Generic CONOPS   ☐ TSA Firmware
☐ Sustainability Guidelines   ☐ SLD Strategic Plan   ☐ Others_____

9. Organizations Impacted / Involved in Review

☐ AGSC/TtEC   ☐ LANL   ☐ SNL   ☐ TVI
☐ PNNL   ☐ SI International   ☐ TSA   ☐ ORNL
☐ Other _____

10. CCB Basis of Disposition: Approval ☐ Disapproval ☐

11. CCB Authorized Signature:

_____Date:_____/_____/_____

12. SLD CM Administrator: **13. Date Master Equipment List Updated:**